## Percentage

1.	If 75% of a number is added to 75, the result is the number itself. Then the
	number is
~ (	

Ans.300

Difficulty level: Easy \_\_\_\_\_Moderate easy \_\_\_\_difficult \_\_\_\_

Basic formula:

$$X\% = x / 100$$

a/b as percent: (a/b x 100) %

Answer with explanation

Take the number as x

$$75\% \text{ of } x + 75 = x$$

$$75/100 + 75 = x$$

$$75 = x - 75/100 x$$

$$75 = x - \frac{3}{4} x$$

$$75 = x/4$$

$$\rightarrow$$
 x = 300

2. Subtracting 40% of a number from the number, we get the result as 30, the number is Ans: 50

30

Difficulty Level : Easy \_\_\_\_ Moderetely Easy \_\_\_\_ Difficult \_\_\_\_

Answer with explanation:

Consider the number as x

$$x - 40/100 x =$$

$$x - 2/5 x = 30$$

$$3/5 x = 30$$

$$3x = 150$$

$$x = 150/3$$

$$x = 50$$

- 2. If three fifth of a number is 40 more than 40% of the same number
- 3. If three fifth of a number is 40 more than 40% of the same number. What is the number Ans: 200

## Difficulty level \_\_ easy \_\_ moderately easy \_\_ difficult \_\_

Answer with explanation

Consider the number as x

$$3/5 x = 40 + 40 \% \text{ of } x$$
  
=  $40 + 40/100x$ 

$$3/5 \text{ x} - 40/100 \text{ x} = 40$$

$$3/5x - 2/5x = 40$$

$$1/5 x = 40$$

$$\rightarrow$$
 x = 200

4. A number on subtracting 15 from it, reduces to its 80% what is 40% of that number?

Difficulty level \_\_ easy \_\_ moderately easy \_\_ difficult \_\_

Answer with explanation:

Let the number be x

$$x-15 = 80\%x$$

$$x - 15 - 80/100 x$$

$$x - 15 = 4/5 x$$

$$x - 4/5 x = 15$$

$$x / 5 = 15$$

**→** 75

Now,

$$= 40/100 \times 75$$

$$=2/5 \times 15$$

$$=30$$

Hint:

$$30\% (75) = 80/100 \times 75 = 60 ---(1)$$
$$= 75 - 15 = 60 ---(2)$$

$$(1)=(2)$$

5, Calculation shows that an angle is	37 ½ %. T	he size obtained	l by drawing and
measurement is 36%. The error perc	ent is		

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

Let the number be x

$$X - 15 = 80\% x$$

$$X - 15 = 80\% x$$

$$X-15 = 4/5 x$$

$$X - 4/5 = 15$$

$$X / 5 = 15$$

$$X = 75$$

Now, 40% of 75

$$=40 / 100 \times 75$$

$$= 2 / 5 \times 15$$

$$= 30$$

Hint:

$$30\% (75) = 80/100 \times 15 = 60 \longrightarrow (1)$$

→ 
$$75-15 = 60$$
 --(2)

1=2

percentage, BU

5. Calculation shows that an angle is 37 ½ % The size obtained by drawing and measurement is 36%. The error percent is

Ans: 4

Difficulty level: Easy Moderately Easy difficult

Basic Formula

Answer with explanation:

Error for 37 ½

$$\rightarrow$$
 37 ½ - 36 = 75 / 2 = 36

= 75- 72 / 2 = 
$$3/2$$
 (=1  $\frac{1}{2}$ ) error for 100

$$= 3/2 \times 2/75 \times 100$$

$$=4\%$$

7. If x is 90% of Y, what percent of x is y? ans: 111.1

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

Answer with explanation:

$$X = 90 \% \text{ of } y$$

$$X = 90/100 \text{ y}$$

$$X = 9/10 y$$

→ 
$$y = 10/9 x$$

$$\rightarrow$$
 y / x = 10/9

required percentage = y/x x 100

$$= 10/9 \times 100$$

$$= 1.111 \times 100$$

8. If x % of y is the 4/5 of 80, then the value of xy is

ans: 6400

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

Answer with explanation:

$$X \% \text{ of } y = 4/5 \times 80$$

$$X / 100 x y = 4/5 x 80$$

$$xy = 4 \times 16 \times 100$$

$$xy = 6400$$

9. Subtracting 6% of % from x is equivalent to multiplying % by how much?

Ans: 94

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

Answer with explanation:

Consider the number as x

$$X - 6/100 = xy$$

$$100 / 100 x - 6 / 100 x = xy$$

$$100-6 / 100 x = xy$$

$$94/100 x = xy$$

94% of x = 
$$xy$$

$$= y = 94\%$$

10. If 
$$8\%$$
 of  $x = 4\%$  of y, then 20% of x is

ans: 10

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

Answer with explanation:

$$8\% \text{ of } x = 4\% \text{ of } y$$

$$8x / 100 = 4 / 100 \text{ y} \implies 8x = 4y$$

$$\Rightarrow 2x = y$$

$$\Rightarrow x = \frac{1}{2}y$$

$$20\% \text{ of } x = 20/100 \text{ x}$$

$$= 20/100 \times \frac{1}{2} y$$

$$= 10/100 \text{ y}$$

$$= 10\% \text{ of y}$$

11. 
$$(X\% \text{ of } Y + Y \% \text{ of } X) = ?$$

Ans: 2% of xy

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

Answer with explanation:

$$X \% \text{ of } y + y \% \text{ of } X$$

$$= xy / 100 + yx / 100$$

$$= 2 \times y / 100$$

$$= 2\% xy$$

12. If 90% of A=30% of B and b=x% of A, then x is equal to ans: 300

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

Answer with explanation:

$$90\%$$
 of A =  $30 \%$  of B

$$90 / 100 A = 30 / 100 B$$

$$90A = 30B$$

$$9A = 3B$$

$$3A = B$$

B = 
$$x/100 A$$

$$3A = x / 100 A$$

→ 
$$x = 300$$

13. x% of Y is y% of?

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

### Answer:

X% Y

$$\rightarrow$$
 y% of X

Ans: X

14. A number increased 37  $\frac{1}{2}$  % gives 33. The number is Ans: 24

$$(100 + 37 \frac{1}{2}) \% \text{ of } x = 33$$

$$(100+75/2)$$
 % of x = 33

$$(200+75/2)$$
 % of x = 33

$$= 275 / 2 \times 1 / 100 \times = 33$$

$$x = (33 \times 100 \times 2) / 275$$

$$= 3 \times 4 \times 2$$

$$x = 24$$

15. The number which when decreased by 27  $\frac{1}{2}$  % given 87 is Ans: 120

Answer

$$(100-27 \frac{1}{2}) \% \text{ of } x = 87$$

$$200-55/2 \times 1/100x = 87$$

$$145/2 \times 100 = 87$$

$$x = 87 \times 2 \times 20/145$$

$$=$$
 3 x 2 x20  $=$  120

16. 40 Quintal is what percent of 2 metric tones?		
Ans: 200%		
Difficulty level: Easy Moderately Easy difficult		
1 metric tonee= 10 quintals		
2 metric tonee = 20 quintals		
$= (40 / 20 \times 100) \%$		
= (2 x 100) %		
= 200%		
17. It is known that 20% of the mangoes are rotten. If the number of rotten mangoes is 35, then the total number of mangoes is Ans: 175		
Difficulty level: Easy Moderately Easy difficult		
20% x = 35		
20 / 100 = 35		
1/5 = 35		
x = 175		
18. If 70% of students in a school are boys and the number of girls is 504, the number of boys is ans: 1176		
Difficulty level: Easy Moderately Easy difficult		
Answer:		
70% of students in a school are boys:		
$(100-70)\%$ = 30% $\rightarrow$ girls percentage		

$$30\% \text{ of } x = 504$$

$$30/100x = 504$$

$$3/10 x = 504$$

$$x = 504 \times 10 / 3$$

$$= 1680$$
No of boys = 70% of 1680
$$= 70/100 \times 1680$$

$$= 1176$$

19.A student has to secure 40% marks topass. He gets 178 marks and failed by 22 marks. The maximum marks are :

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

$$40\% x = 178 + 22$$

$$40/100 \text{ x} = 200$$

$$2/5 x = 200$$

$$x = 100 \times 5/2$$

$$x = 500$$

20. A house owner was having his house painted. He was advised that he would require 25kg of paint. Allowing for 15% wastage and assuming that the paint is available in 2kg cans, what would be the cost of pain purchased, if one can cost Rs.16? Ans: 240Rs.

Answer:

Required no of kgs 
$$\rightarrow$$
 25kg  
10%  $\rightarrow$ 2.5  
5% / 15%  $\rightarrow$  1.25 / 28.75kg

1 can contains 2kg paint

 $= 15 \times 16 = 240$ 

1 can = 16 Rs.

21. A reduction of 12.5% in the price of a dining table brought down its price to Rs.4375, the original price (in Rs.)of the table was:

Ans: Rs.5000

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

Answers:

The original price to be x

$$X - 12.5\%$$
 of x = 4375  
 $X - 12.5/100$  x = 4375  
 $X - 125/1000$  x = 4375  
 $1000-125/1000$  x = 4375  
 $x = 4375$   
 $x = 4375$  x  $x = 4375$ 

22. Of the total amount received by Kiran, 20% was spent on purchases and 5% of the remaining on transportation. If he is left with Rs.1520, the initial amount was Ans: 2000

=Rs.5000

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

Answer:

For purchase 20% of x => 20/100 x = 1/5 x

Remaining x - 1/5 = 4/5 x

For transportation == 
$$5 \% 4/5 x$$
  
=  $5/100 \times 4/5 x$   
=  $x/25$ 

Balance = 
$$4x / 5 - x / 25 = 20x / 25 - x / 25 = 19 / 25 x$$
  
 $19x / 25 = 1520$   
 $x = 1520 x 25 / 19$   
 $x = 2000$ 

23. In a library 20% books are in Hindi, 50% of the remaining are in English and the remaining 9000 are in various other languages. What is the total number of books in English.

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

#### Answers:

Let the no of books be x 20% of  $x = 20/100 \Rightarrow x/5$ 

Remaining  $\rightarrow x - x / 5 = 4x / 5$ 

For English  $\rightarrow$  56/100 x 4x / 5

$$\rightarrow$$
 2x/5

Remaining 
$$4 \times / 5 - 2 \times / 5 = 2 \times / 5$$

For other languages

$$2x / 5 = 9000$$

$$2x = 45000$$

$$x = 22500$$

#### Another method

Let it be 100 %

Hindi 20% (-20)/80

Eng 50% of remaining (-40)/40 = 9000

$$= 100$$

 $9000 \times 100/40 = 22500$ 

24. Avinash spends 30% of his income on scooter petrol, ½ o the remaining on house rent and the balance on food. If he spends Rs.300 on petrol, then what is the expenditure on house rent?

Ans: 175

Difficulty level: Easy Moderately Easy difficult

Answer:

From the given information,

Method: 1

For scooter petrol

$$30x / 100 = 3x / 10$$

remaining 
$$\rightarrow x - 3x / 10 = 7x / 10$$

for house 
$$\rightarrow \frac{1}{4} \times 7 \times / 10 = 7 \times / 40$$

remaining for food -- > 7x / 10 - 7 x / 40

$$=> 28 x - 7x / 40 = 21x / 40$$

Amount for petrol = 
$$30/100 \text{ x} = 30$$
  
=  $1000$ 

House rent,

$$7x / 40 = 7 \times 1000 / 40 = 175$$

Method:2

Total income x

$$X - 30/100 x = x - 300$$
  
(in %) = (in Rs.)

$$30 / 100 x = 300$$

x = 1000

$$\frac{1}{4} \times 100 = 175 \text{Rs}.$$

25. A man spends 35% of his income on house rent 75% of the reaming on other items. What percentage of income does he save

Ans: 16.25

Answers:

Consider the total income as Rs.100

Total In Rs.100

House rent 35% Rs. 35

Remaining Rs. 65

Other expenses 75% of Rs.65 = Rs.48.75

-----

Rs. 16.25

He save Rs.16.25

75% of 65

- → 75 / 100 x 65
- → 3/4 x 65
- **→** 195/4

=48.75

26. 88% of 370 + 24% of 210 - ? = 188.

() 256 () 258 () 268 () 358

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

Answers:

Answers:

Let the price of an article = Rs.100

It is reduced by 20% = 20/80

(20% of Rs.100)

Reduced price Rs.80

Increased price x % = 20/80

x/100 = 20/80

 $x = \frac{1}{4} \times 100$ 

x = 25%

30. Income of a broker remains unchanged through the rate of commission is increased from 4% to 5%. The percentage slump in business is

Answer: 20%

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

4% for 100 -> 100

4% of 100 -> 25/75 --1

5% for 100 -> 100

5% of 100 -> 20/80 ----2

Difference 80-75 = 5

Rs.5 for 100 == 100/5 %

== 20%

31. Two numbers are less than a third number by 30% and 37% respectively. How much percent is the second number less than the first?

answer: 10%

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

Answer;

### First number $\rightarrow 100$

$$30\% (100) \rightarrow 30/70$$

Difference 
$$\Rightarrow$$
 70 – 63 = 7

Diff % == 
$$7 / 70 \times 100$$

$$=10\%$$

32. A bag contains 600 coins of 25p denomination and 1200 coins of 50p denomination, If 12% of 25p coins and 24% of 50p coins are removed, the percentage of money removed from the bag is nearly answer:

Coin	paise	Rs.
600x 25 1200 x 50	15000 6000	Rs.150 Rs.600
		Rs.750

72 coins money 
$$72x25 = Rs.18$$

% of money removed is  $Rs.162/Rs.750 \times 100 = 21.6\%$ 

= Ans: 21.6%

33. In an examination, A got 10% marks less than B, B got 25% marks more than C and C got 20% less than D. If A got 360 marks out of 500, the percentage of marks obtained by D was:

Answer: 80%

Answer:

A got 360 out of 500

For B,

$$X - 10 \times / 100 = 360$$

$$9x/10 = 360$$

$$= x = 360 \times 10/9$$

$$x = 400$$
For C,  $x + 25/100x = 400$ 

$$X + \frac{1}{4}x = 400$$

$$5x / 4 = 400$$

$$= x = 400 \times 4 / 5$$

$$= 320$$
For D,

$$x-20/100 x = 320$$
 $4x/5 = 320$ 
 $x = 320 x 5/4$ 
D got 400 marks
% of D is 400/500 x 100
 $80\%$ 

34. If the numerator of a fraction is increased by 15% and its denominator be decreased by 8% the value of the fraction becomes 15/16. The original fraction is answer: 3/4

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

Answer:

Increased by 15% - > 100 + 15 = 115Decreased by  $8\% \rightarrow 100-8 = 92$ 

115/100x / 92/100y 15/16

115/100x x 100/92 x 1/y 15/16

$$x/y \times 115/92 = 15/16$$

$$x/y = 15/16 \times 92 / 115$$

$$x/y = \frac{3}{4}$$

35.In an examination, 35% of total student failed in Hindi, 45% failed in English and 20% in both. The percentage of those who passed in both subjects is? ans: 40

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

both = 
$$(100-20)\%$$

$$65/100 + 55/100 - 80/100 = 120-80/100$$

Hint:

$$P(AUB) = P(A) (+p(B) - P(A \cap B)$$

$$=40/100$$

# → 40% passed in both subjects

36. The price of sugar increased by 20%. By what percent must a house wife reduce the consumption of sugar, so that the expenditure on sugar is the same as before?

Answer: 16 2/3

Difficulty level: Easy \_\_ Moderately Easy \_\_ difficult \_\_

Answers:

Increased 20% 
$$\rightarrow$$
 100 + 20 -120

Reduction in consumption = 
$$R/100+R$$
 x 100

$$=$$
 20/120 x 100

$$=$$
 16 2/3

ratio between the re	is increased by 25%. If the expenditure is not allowed to increase, the duction in consumption and the original consumption is			
answer: 1:5 Difficulty level: Eas	sy Moderately Easy difficult			
38. If the price of sugar rises from Rs6 per kg to Rs.7.50 per kg, a person to have no increase in his expenditure on sugar, will have to reduce his consumption of sugar by Answer: 20%  Difficulty level: Easy Moderately Easy difficult				
	39. The population of a town increase of 15% annually. If its population was 8000 in 1995, what will it be in 1997? Answer: 10,580			
Difficulty Level	: Easy Moderately easy Difficult			
Basic Formula:				
P(1+ R/100) <sup>n</sup>				
Answer with Explanation:				
P =8000 R =15 in 2 years =8000 x (1 + = 8000 x (115	$15/100)^2$			
=8000 x 23/2	0 x 23/20			
$= 40 \times 23 \times 2$	3			
= 10580				
Method: 2				
P 15% 8000 1996 15% 9200 1997	-> 8000 -> 1200 →9200 -> 1380 →10580			

	tion of a town is 18000. It increases by 10% during $1^{st}$ year ing the $2^{nd}$ . The population after 2 years will be:
Difficulty Level	l : Easy Moderately easy Difficult
Basic Formula:	
P(1+ R/1)	00) <sup>n</sup>
Answer with E	xplanation:
p→ 18000	
for Ist year	$R \rightarrow 10\%$
for IInd ye	ear R -> 20%
18000 x (1	+10/100) x $(1 + 20/100)$
= 18000  x	110/100 x 120/100
= 18000  x	11/10 x 12/10
= 23760	
Method 2:	
P ->	> 18000
10% of 18000	1800
20% of 19800	19800 3960
	23760

41. The value of a sewing machine depreciates every year by 4%. Its value at present is Rs.200. What will be its value after 2 years? Answer: 184.32 **Difficulty Level: Easy** Moderately easy Difficult **Basic Formula:**  $P(1-R/100)^{n}$ **Answer with Explanation:**  $P \rightarrow 200$  $R \rightarrow 4\%$  $N \rightarrow 2 \text{ yrs}$  $= 200 \times (1 - 4/100)^2$  $= 200 \times (96/100)^2$  $= 200 \times 96/100 \times 96/100$  $= 200 \times 24/25 \times 24/25$ 

= 184.32

42. The population of a city increases at the rate of 5% annually. Its present population is 1,85,220. Its population 3 years ago was:

Answer: 1,60,000

### **Basic Formula:**

$$P / (1 + R/100)^n$$

# **Answer with Explanation:**

$$= \frac{185220}{(1+5/100)^3}$$

$$= 185220 \times 20/21 \times 20/21 \times 20/21$$

$$= 160000$$

previous month for next 3 mont 2005, it produced 3000 ball pens March 2005? Answer: 2,340		,
Difficulty Level : Easy M	oderately easy	Difficult
Basic Formula:		
P ( 1- R/100)n		
Answer with Explanation: p→ 3000 R → 10%		
(	→ 3000 x 90/100 x 90/100 → 3 x 810	

**→**2430

43. A ball pen factory decided to reduce its production by 10% over that of

44. Due to an increase of 30% in price of eggs, 3 eggs less are available for Rs. 7.80. The present rate of eggs per dozen is ? Answer: Rs. 9.36
Difficulty Level : Easy Moderately easy Difficult
Basic Formula:
Answer with Explanation:

45. The price of a shirt is increased by 15% and then reduced by 15%. The final price of the shirt is ? Answer: 2.25% decrease
Difficulty Level : Easy Moderately easy Difficult
Basic Formula:
Answer with Explanation:

46. If the radius of a circle is decreased by 50%, its area is reduced by :
Answer:75%
Difficulty Level : Easy Moderately easy Difficult
Basic Formula:
Answer with Explanation:

$47.\ A$ student has to obtain 33% of the total marks to pass. He got 125 marks and failed by 40 marks. The Maximum marks are : Answer : $500$	
Difficulty Level : Easy Moderately easy Difficult	
Basic Formula:	
Answer with Explanation:	

Answer: 30,000

Difficulty Level: Easy Moderately easy Difficult

Basic Formula:

**Answer with Explanation:** 

48. From the salary of an officer, 10% is deducted as house rent, 20% of the rest, he spends on conveyance, 20% of the rest he pays as income tax and 10% of the balance, he spends on cloths. Then, he is left with Rs. 15,552.

49. The freight of machine amounts to 20% of its price. Had the price been 10% less than what it is, the tatal const of the machine would have been Rs. 480 less. What is the price of the machine? Answer: 4,000
Difficulty Level: Easy Moderately easy Difficult
Basic Formula:
Answer with Explanation:

50. A man gave 30% of his money to his wife, 40% of the remainder to his son and the remaining money equally to his three daughters. If each daughter get Rs. 224, what does the wife get?

Answer: 480

Difficulty Level : Easy Moderately easy Difficult

### **Basic Formula:**

# Let the money be x

30% for his wife

$$\rightarrow$$
 (30/100) x  $\rightarrow$  (3 /10) x

remaining 
$$x - (3/10)x = 7x / 10$$

for his son 40%

$$40/100 (7x/10) = (28/100)x$$

remaining

$$7x / 10 - 28x / 100 = 42x / 100$$

for his three daughters  $42x / 100 \times 1/3 = 224$ 

$$= 14 \text{ x} / 100 = 224$$

$$x = 224 \times 100 / 14$$

$$x = 1600$$

wife get the amount is

$$30/100 \times 1600 = 480$$

Rs.480

**Answer with Explanation:** 

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